

GC-MS Profiling Analysis Prepared for Jade Bloom, Inc

Date: January 26, 2018
Sample: Balsam Fir Needle
Type: Essential Oil
Source: *Abies balsamea*
Batch: 7235

| Identification | Column: BP5 | | | Column: WAX | | | Molecular Class |
|-----------------------------------|-------------|------|---------|-------------|------|--------|-------------------|
| | R.T. | R.I. | % | % | R.I. | R.T. | |
| Toluene | 1.31 | 758 | 0.02 | 18.06 | 953 | 1.04* | Simple phenolic |
| <i>cis</i> -Hex-3-en-1-ol | 2.50 | 865 | 0.02 | 0.02 | 1331 | 5.17 | Aliphatic alcohol |
| Santene | 2.62 | 874 | 1.20 | 1.19 | 889 | 0.82 | Normonoterpene |
| Tricyclene | 3.23 | 915 | 0.46 | 0.46 | 920 | 0.92 | Monoterpene |
| α -Thujene | 3.31 | 920 | 0.12 | 0.20 | 959 | 1.06 | Monoterpene |
| α -Pinene | 3.46 | 929 | 18.12 | [18.06] | 953 | 1.04* | Monoterpene |
| Camphene | 3.72* | 944 | 3.20 | 3.11 | 1000 | 1.27 | Monoterpene |
| α -Fenchene | 3.72* | 944 | [3.20] | 0.08 | 992 | 1.21 | Monoterpene |
| Thuja-2,4(10)-diene | 3.80 | 949 | 0.06 | 0.14 | 1063 | 1.74* | Monoterpene |
| Benzaldehyde | 4.16 | 970 | 0.09 | 0.07 | 1427 | 6.72 | Simple phenolic |
| β -Pinene | 4.27* | 976 | 33.00 | 32.98 | 1052 | 1.65 | Monoterpene |
| Sabinene | 4.27* | 976 | [33.00] | [0.14] | 1063 | 1.74* | Monoterpene |
| Myrcene | 4.49 | 989 | 1.76 | 1.75 | 1118 | 2.27 | Monoterpene |
| α -Phellandrene | 4.78* | 1006 | 4.74 | 0.42 | 1111 | 2.17 | Monoterpene |
| Δ 3-Carene | 4.78* | 1006 | [4.74] | 4.29 | 1098 | 2.03 | Monoterpene |
| <i>cis</i> -Hex-3-en-1-yl acetate | 4.87 | 1011 | 0.04 | 0.04 | 1263 | 4.18 | Aliphatic ester |
| α -Terpinene | 4.95 | 1015 | 0.24 | 0.23 | 1124 | 2.33 | Monoterpene |
| Limonene | 5.26* | 1032 | 23.21 | 9.99 | 1145 | 2.60 | Monoterpene |
| β -Phellandrene | 5.26* | 1032 | [23.21] | 12.95 | 1153 | 2.69 | Monoterpene |
| <i>para</i> -Cymene | 5.26* | 1032 | [23.21] | 0.29 | 1208 | 3.41 | Monoterpene |
| γ -Terpinene | 5.73 | 1057 | 0.23 | 0.25 | 1186 | 3.14 | Monoterpene |
| Isoterpinolene | 6.12 | 1079 | 0.01 | 0.02 | 1217 | 3.54 | Monoterpene |
| Terpinolene | 6.21 | 1083 | 0.79 | 0.79 | 1222 | 3.61 | Monoterpene |
| Fenchone | 6.35 | 1091 | 0.12 | 0.12 | 1321 | 5.02 | Monoterp. ketone |
| <i>para</i> -Cymenene | 6.43 | 1095 | 0.10 | 0.09 | 1370 | 5.74 | Monoterpene |
| Linalool | 6.70 | 1106 | 0.08 | 0.12 | 1503 | 8.25 | Monoterp. alcohol |
| endo-Fenchol | 7.16 | 1123 | 0.11 | 0.11 | 1519 | 8.75 | Monoterp. alcohol |
| <i>trans</i> -Pinocarveol | 7.62 | 1139 | 0.20 | 0.20 | 1574 | 10.49 | Monoterp. alcohol |
| Camphor | 7.76 | 1144 | 0.18 | 0.16 | 1424 | 6.67 | Monoterp. ketone |
| Camphene hydrate | 8.05 | 1155 | 0.09 | 0.12 | 1523 | 8.88 | Monoterp. alcohol |
| Pinocarvone | 8.22 | 1161 | 0.08 | 0.05 | 1477 | 7.71 | Monoterp. ketone |
| Borneol | 8.66 | 1177 | 0.61 | 0.49 | 1623 | 12.32 | Monoterp. alcohol |
| Terpinen-4-ol | 8.81 | 1182 | 0.30 | 0.38 | 1531 | 9.15 | Monoterp. alcohol |
| Cryptone | 9.18 | 1196 | 0.06 | 0.06 | 1568 | 10.32 | Monoterp. ketone |
| Myrtenol | 9.33 | 1200 | 0.10 | 0.10 | 1712 | 16.54 | Monoterp. alcohol |
| α -Terpineol | 9.50 | 1203 | 0.87 | 0.78 | 1628 | 12.58 | Monoterp. alcohol |
| endo-Fenchyl acetate | 9.99 | 1214 | 0.02 | 0.02 | 1412 | 6.43 | Monoterp. ester |
| Thymol methyl ether | 10.63 | 1228 | 0.23 | 0.24 | 1524 | 8.93* | Monoterp. ether |
| Piperitone | 11.80 | 1254 | 0.13 | 0.18 | 1625 | 12.42* | Monoterp. ketone |
| Bornyl acetate | 12.97 | 1279 | 4.98 | 4.92 | 1509 | 8.43 | Monoterp. ester |
| Thymol | 15.86 | 1329 | 0.16 | 0.11 | 2117 | 39.04 | Monoterp. alcohol |

| | | | | | | | |
|-------------------------------------|-------|------|---------------|---------------|------|--------|---------------------|
| Longifolene | 19.69 | 1386 | 0.95 | 0.99 | 1483 | 7.84 | Sesquiterpene |
| β -Caryophyllene | 20.60 | 1399 | 0.32 | [0.24] | 1524 | 8.93* | Sesquiterpene |
| α -Humulene | 23.40 | 1433 | 0.16 | 0.16 | 1578 | 10.61 | Sesquiterpene |
| <i>trans</i> - β -Farnesene | 24.49 | 1446 | 0.07 | 0.16 | 1617 | 12.06 | Sesquiterpene |
| Germacrene D | 25.71 | 1460 | 0.06 | [0.18] | 1625 | 12.42* | Sesquiterpene |
| β -Bisabolene | 28.88 | 1498 | 0.89 | 0.85 | 1655 | 13.77 | Sesquiterpene |
| <i>trans</i> - α -Bisabolene | 31.87 | 1540 | 0.09 | 0.08 | 1704 | 16.04 | Sesquiterpene |
| (<i>E</i>)-Nerolidol | 33.87 | 1568 | 0.05 | 0.04 | 1991 | 34.28 | Sesquiterp. alcohol |
| <i>cis</i> -Abienol | 51.61 | 2137 | 0.17 | 0.17 | 2672 | 51.16 | Diterp. alcohol |
| Total identified | | | 98.49% | 98.03% | | | |

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

Note: no correction factor was applied

OTHER DATA

Physical aspect : Clear liquid

Refractive index : 1.4745 \pm 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent were detected using this method.

